AEI Consultants

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Environmental & Engineering Services

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January 9, 2017

Ms. Barbara Hicks McPhail
BASF Facility - Cranston
100 Park Avenue
Florham Park, NJ 07932
Direct: 207.853.2501
Barbara.hicks@partners.basf.com

Subject: **Asbestos Abatement Oversight and Air Sampling Services for the BASF Facility located at 180 Mill Street, Cranston, RI**
AEI Project No. 362401

Dear Ms. Hicks McPhail:

AEI Consultants was retained by BASF Corporation to perform the following:

1. Full-time monitoring and oversight during asbestos abatement activities in Buildings 15, 25, 20, 26 and for the Facility Bridge at the above-referenced location. Included oversight of all setup and tear-down activities for asbestos abatement activities.
2. Daily background air monitoring of interior and exterior work areas.
3. Inspection of on-site abatement Contractor's personnel paperwork and medical monitoring information.
4. Periodic monitoring of abatement activities including inspection of all containments to confirm full containment integrity.
5. Post abatement visual inspection and post-abatement validation air sampling to document that the asbestos abatement was complete and the location was acceptable for re-occupancy.
6. Visual inspection for the proper removal and disposal of regulated materials.
7. Verify work was performed in accordance with the previously executed Terms and Conditions and in accordance with the attached Limitations and Service Constraints.

AEI's services were performed in accordance with our proposal dated April 8, 2016.

The abatement project was initiated on September 27, 2016, by a licensed asbestos abatement contractor, Bristol Environmental, Inc. of Billerica, MA, and air sampling was conducted by AEI on a full-time basis from September 30, 2016 to December 16, 2016. Containment area tear-down was completed by December 15, 2016. Please see the attached Tables for the materials that were removed during the abatement project. Asbestos Containing Materials that were removed are listed on Table 1. AEI's licensed Project Monitor certifications are included with this letter as Attachment A.

The abatement containment areas passed final visual inspection prior to the performance of aggressive air clearance sampling in accordance with state and federal regulations. During the asbestos abatement activities, a total of three hundred twenty-three (323) background air samples, including blanks, were collected for analysis by Phase Contrast Microscopy (PCM) and the National Institute for Occupational Safety & Health (NIOSH) Method 7400 by EMSL Analytical, a Rhode Island licensed analytical laboratory. A total of thirty-five (35) clearance air samples, including blanks, were collected and submitted to EMSL Analytical, Inc. for Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) performed in accordance with EPA CFR Part 763 Appendix A to Subpart E Method. A total of twenty-one (21) final clearance air samples, including blanks, were collected for analysis by Phase Contrast Microscopy (PCM) and the National Institute for Occupational Safety & Health (NIOSH) Method 7400 by EMSL Analytical. Environmental Protection Agency (US EPA) has a recommended guideline for "clean" (uncontaminated) air. Results obtained by AEI indicated that background and clearance levels for asbestos were below acceptable levels as specified in state and federal regulations.

Upon completion of the abatement activities, asbestos materials in the form of the following materials will remain in place (in good condition) with no access to the facility by persons except designated site operations and maintenance personnel who will on occasion access for inspection purposes.

- Flange Gaskets
- Exterior Door Caulk
- Roofing Materials
- Cementitious Panels-Associated with Air Handling Unit on Building 15
- Black expansion Joint Caulk
- Black Waterproofing Associated with Brick Facades
- Gray expansion Joint Caulk

On December 12, 2016, AEI inspected Building 20/26 for the proper disposal of regulated materials including: PCB-containing light ballasts and fluorescent light bulbs. All materials were removed in accordance with Rhode Island Department of Public Health (RIDPH) regulations. The regulated materials that were removed are listed on Table 2.

In accordance with RIDPH regulations and based upon the visual inspection and the laboratory analytical results of air sampling performed, the abatement project is considered complete and deemed clear for re-occupancy. Air sample analytical data is provided as Attachment B to this letter report. Daily field reports and safe work permits are included with this report as Attachment C. Certificate of visual inspections are included with this report as Attachment D.

Original waste shipment records, waste manifests and/or certificates of reclamation documenting the proper handling and disposal of the generated asbestos and the regulated materials (fluorescent bulbs and associated ballasts in Buildings 20 and 26 only) was provided by Bristol Environmental Inc. and is presented in Attachment E.

Should you have any questions regarding the abatement services performed, please feel free to contact Geoff Gerace at 978.995.5101 or Michael Capozzi at 904.553.0549.

Prepared By:

Geoff Gerace
Project Manager II

Reviewed By:

Michael F. Capozzi
Senior Project Manager

Cc: Stephen Graham/AEI Consultants
Rick Kowalski/AEI Consultants

Tables
Asbestos and Regulated Materials Abatement Tables

Attachments:
Attachment A – AEI Asbestos Personnel and EMSL Qualifications
Attachment B – PCM and TEM Air Sample Laboratory Reports
Attachment C – Daily Field Reports and Safe Work Permits
Attachment D – Certificate of Visual Inspections
Attachment E – Waste Manifests
Attachment F – Asbestos Abatement Photographic Log
Attachment G – Limitations and Service Constraints

Table 1
Asbestos Abatement Table
for Asbestos-Containing Caulking
180 Mill Street
Facility Bridge
Cranston, Rhode Island

Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
FACILITY BRIDGE - ABATEMENT AREA 1								
Not Provided	Caulking beneath the Railing Supports	Facility Bridge	Beneath Railing Supports	35 LF	Fair	092815-B04A 092815-B04B	10% Chrysotile	Samples collected by AECOM. HA Number Not Provided

Table 1
Asbestos Abatement Table
Buildings 15 and 25
180 Mill Street
Cranston, Rhode Island

Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
BUILDING 15 - ABATEMENT AREA 1								
M-05	12" x 12" Tan Vinyl Floor Tile	15	Warehouse Office	180 SF	Fair	05, 05A	3% Chrysotile	Mastic Does Not Contain ACM
M-09	Door Caulk	15	Warehouse Office	50 LF	Good	09, 09A	5% Chrysotile	
M-11	Window Glazing	15	Warehouse Office	2 Windows	Fair	11, 11A, 11B	3% Chrysotile	
BUILDING 15 - ABATEMENT AREA 2								
M-32	Tan Vinyl Sheet Flooring and Associated Mastic	15	Main Office	130 SF	Good	32, 32A	20% Chrysotile	
BUILDING 15 - ABATEMENT AREA 3								
M-12	Roof Cement	15	2nd Floor Stairwell and South Side of 2nd Floor	75 SF	Good	12, 12A	5% Chrysotile	Located on the 2nd Floor - Interior
BUILDING 25 - ABATEMENT AREA 4								
M-09	Interior Door Caulk	25	1st Floor Throughout	130 LF - 5 Doors	Good	09, 09A	5% Chrysotile	
M-26	12" x 12" Tan Vinyl Floor Tile	25	1st Floor Office	350 SF	Fair	26, 26A	4% Chrysotile	
M-27	Black Mastic associated with 12" x 12" Tan Vinyl Floor Tile	25	1st Floor Office	350 SF	Fair	27, 27A	5% Chrysotile	
M-30	Window Caulking	25	1st Floor Bathroom and Office and Perimeter Windows	720 LF	Fair	30, 30A	5% Chrysotile	

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Asbestos Abatement Table
Buildings 15 and 25
180 Mill Street
Cranston, Rhode Island

Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
BUILDING 25 - ABATEMENT AREA 5								
M-26	12" x 12" Tan Vinyl Floor Tile	25	2nd Floor Office	250 SF	Fair	26, 26A	4% Chrysotile	
M-27	Black Mastic associated with 12" x 12" Tan Vinyl Floor Tile	25	2nd Floor Office	250 SF	Fair	27, 27A	5% Chrysotile	
M-30	Window Caulking	25	2nd Floor - Perimeter Windows	995 LF	Fair	30, 30A	5% Chrysotile	
BUILDING 25 - ABATEMENT AREA 6								
T-01	Fire Door Insulation	25	Basement, Stairwells	8 Doors	Poor	01, 01A, 01B	20% Amosite 10% Chrysotile	
T-02	Pipe Elbow Insulation	25	Basement	15 EA	Good	02, 02A, 02B, 02C, 02D	30% Chrysotile	
T-03	White Block Pipe Insulation	25	Basement	1,200 LF	Fair	03, 03A, 03B	20% Amosite 10% Chrysotile	
T-02 & T-03	Pipe Elbow Insulation & White Block Pipe Insulation Thermal Debris	25	Basement	19,800 SF	Poor	03, 03A, 03B	20% Amosite 10% Chrysotile	Pre-Cleaning of Basement to be Performed Prior to the Construction of Any Containments.

Table 1
Asbestos Abatement Table
for Interior Building Materials
180 Mill Street
Cranston, Rhode Island

Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
BUILDINGS 20 & 26 - BASEMENT - ABATEMENT AREA 1								
M-36	Fiberglass Pipe Sealant	20	Basement - Throughout the Basement	5,500 LF	Fair	36, 36A, 36B	15% Chrysotile	
M-36	Fiberglass Pipe Sealant	26	Basement - Throughout the Basement	6,100 LF	Fair	Not Sampled, Similar to Samples 36, 36A, 36B	Assumed ACM	
M-37	Cementitious Panels	20	Basement - Throughout the Basement - Lab Hoods (including Shelving and Assorted Panels)	1,500 SF	Good	37, 37A, 37B	15% Chrysotile	
M-37	Cementitious Panels	26	Basement - Throughout the Basement - Lab Hoods (including Shelving and Assorted Panels)	500 SF	Good	37B, 37C	15% Chrysotile	
M-38	Lab Countertops	20	Basement - Throughout the Basement	1,200 SF	Good	38, 38A, 38B, 38C	15% Chrysotile	
M-41	Stick Pin Mastic Associated with Duct Insulation	20	Basement - Fan Room	600 SF	Good	41, 41A	10% Chrysotile	
M-54 & M-74	Window Caulking	20	Exterior Windows	275 LF	Good	M-54, M-54A M-74, M-74A M-74B	3% to 5% Chrysotile	
M-55	Black Caulk on Glass Roof Drain	20	Basement - Lab Areas	30 SF	Good	Not Sampled	Assumed ACM	
M-71	Red Duct Sealant	20/26	Basement - Throughout the Floor	500 SF	Good	71, 71A, 71B	4% Chrysotile	

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Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
M-82	Brown Residual Cove Base Mastic	26	Basement - Ramp to Basement and Building Maintenance	400 LF	Fair	82, 82A	2% Chrysotile	
S-04	Textured Paint	26	Basement - Ramp to Basement and Building Maintenance	4,700 SF	Good	04, 04A, 04B, 04C, 04D	2% Chrysotile	
T-02	Pipe Elbow Insulation	20	Basement - Throughout the Floor	1,085 EA	Fair	02, 02A, 02B, 02C, 02D	30% Chrysotile	
T-03	White Block Pipe Insulation	20	Basement - Throughout the Floor	735 LF	Fair	03C	25% Chrysotile	
T-04	Boiler Breeching	20	Basement - Equipment Room	200 SF	Good	04, 04A, 04B	15% Chrysotile	
T-05	Square Box Insulation	20	Basement - Fan Room, Equipment Room	100 SF	Fair	05, 05A, 05B	20% Amosite	
T-07	Duct Insulation	20	Basement - Fan Room	600 SF	Fair	07, 07A	25% Chrysotile	
T-16	Tank Insulation	26	Basement - SW Side of the Floor	100 SF	Fair	16, 16A, 16B	65% Chrysotile 10% Amosite	
T-10	Duct Insulation	20/26	Basement - Throughout the Basement	4,800 SF	Good	10, 10A, 10B	Assumed ACM	
T-14	White Block Pipe Insulation	20/26	Basement - Throughout the Basement	5,200 LF	Poor	14, 14A, 14B	15% Chrysotile	
T-02, T-03 & T-14	Pipe Elbow Insulation & White Block Pipe Insulation Thermal Debris	20/26	Basement - Throughout the Basement	25,000 SF	Poor	14, 14A, 14B	15% Chrysotile	Pre-Cleaning of Entire Building to be Performed Prior to the Construction of Any Containments.

Table 1
Asbestos Abatement Table
for Interior Building Materials
180 Mill Street
Cranston, Rhode Island

Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
BUILDINGS 20 & 26 - 1ST FLOOR - ABATEMENT AREA 2								
M-36	Fiberglass Pipe Sealant	20	1st Floor-Throughout the Floor	5,500 LF	Fair	36, 36A, 36B	15% Chrysotile	
M-37	Cementitious Panels	20	1st Floor - Throughout the Floor - Lab Hoods (including Shelving and Assorted Panels)	1,500 SF	Good	37, 37A, 37B	15% Chrysotile	
M-37	Cementitious Panels	26	1st Floor - Throughout the Floor - Lab Hoods (including Shelving and Assorted Panels)	2,800 SF	Good	37B, 37C	15% Chrysotile	
M-38	Lab Countertops	20	1st Floor - Throughout the Floor	1,200 SF	Good	38, 38A, 38B, 38C	15% Chrysotile	
M-45	9" x 9" Gray Vinyl Floor Tile	20	1st Floor - SE Side of the Floor	300 SF	Fair	45, 45A, 45B, 45C	6% Chrysotile	
M-46	Black Mastic Associated with 9" x 9" Gray Vinyl Floor Tile	20	1st Floor - SE Side of the Floor	300 SF	Fair	46, 46A, 46B, 45C	5% Chrysotile	
M-47	12" x 12" Tan Vinyl Floor Tile	26	1st Floor - Conference Room (Located beneath Carpet), Room 26A, Room 27A, SW Laboratory and NW Laboratory	3,385 SF	Good	47B, 47C, 47D	3% Chrysotile	MASTIC does not contain ACM. Material is located beneath Countertops and Lab Hoods
M-47	12" x 12" Tan Vinyl Floor Tile	26	1st Floor - Room 26	500 SF	Good	47B, 47C, 47D	3% Chrysotile	Located beneath Countertops and Lab Hoods ONLY in these Areas. MASTIC does not Contain ACM.
M-54 & M-74	Window Caulking	20/26	Exterior Windows	875 LF	Good	M-54, M-54A M-74, M-74A M-74B	3% to 5% Chrysotile	

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Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
M-55	Black Caulk on Glass Roof Drain	20	1st Floor - Lab Areas	30 SF	Good	Not Sampled	Assumed ACM	
M-56	9" x 9" Blue Vinyl Floor Tile	26	1st Floor - SW Side of the Floor and Office 29	375 SF	Good	56A, 56B	3% Chrysotile	MASTIC does not contain ACM. Material is located beneath Countertops and Lab Hoods
M-60	Black Sink Mastic	20	1st Floor - Employee Lounge	1 EA	Good	60	5% Chrysotile	
M-61	Pipe Wrap	20	1st Floor - Employee Lounge	3 LF	Good	61, 61A	15% Chrysotile	
M-71	Red Duct Sealant	20/26	1st Floor - Throughout the Floor	500 SF	Good	71, 71A, 71B	4% Chrysotile	
M-72	Cementitious Pipe/Breeching Associated with the Laboratory Hoods	26	1st Floor - Unfinished Areas, Lab Areas and Hallways	200 LF	Good	72, 72A	20% Chrysotile 10% Crocidolite	
M-77	12" x 12" Blue Vinyl Floor Tile	26	1st Floor - West Side of Floor	175 SF	Good	77, 77A	4% Chrysotile	MASTIC does not contain ACM. Material is located beneath Countertops and Lab Hoods
T-02	Pipe Elbow Insulation	20/26	1st Floor-Throughout the Floor	1,085 EA	Fair	02, 02A, 02B, 02C, 02D	30% Chrysotile	
T-03	White Block Pipe Insulation	20	1st Floor-Throughout the Floor	735 LF	Fair	03C	25% Chrysotile	
T-02 & T-03	Pipe Elbow Insulation & White Block Pipe Insulation Thermal Debris	20/26	1st Floor - Throughout the 1st Floor	20,000 SF	Poor	14, 14A, 14B	15% Chrysotile	Pre-Cleaning of Entire Building to be Performed Prior to the Construction of Any Containments.

Table 1
Asbestos Abatement Table
for Interior Building Materials
180 Mill Street
Cranston, Rhode Island

Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
BUILDINGS 20 & 26 - 2ND FLOOR - ABATEMENT AREA 3								
M-36	Fiberglass Pipe Sealant	20	2nd Floor - Throughout the Floor	5,500 LF	Fair	36, 36A, 36B	15% Chrysotile	
M-37	Cementitious Panels	20	2nd Floor - Throughout the Floor - Lab Hoods (including Shelving and Assorted Panels)	1,500 SF	Good	37, 37A, 37B	15% Chrysotile	
M-37	Cementitious Panels	26	2nd Floor - Throughout the Floor - Lab Hoods (including Shelving and Assorted Panels)	2,800 SF	Good	37B, 37C	15% Chrysotile	
M-38	Lab Countertops	20	2nd Floor - Throughout the Floor	1,200 SF	Good	38, 38A, 38B, 38C	15% Chrysotile	
M-47	12" x 12" Tan Vinyl Floor Tile	26	2nd Floor - Room 40	125 SF	Good	47B, 47C, 47D	3% Chrysotile	MASTIC does not contain ACM. Material is located beneath Countertops and Lab Hoods
M-47	12" x 12" Tan Vinyl Floor Tile	26	2nd Floor - South and SW Laboratories	1,260 SF	Good	47B, 47C, 47D	3% Chrysotile	Located beneath Countertops and Lab Hoods ONLY in these Areas. MASTIC does not Contain ACM.
M-54 & M-74	Window Caulking	20/26	Exterior Windows	875 LF	Good	M-54, M-54A M-74, M-74A M-74B	3% to 5% Chrysotile	
M-55	Black Caulk on Glass Roof Drain	20	2nd floor - Lab Areas	30 SF	Good	Not Sampled	Assumed ACM	
M-63	Black Duct Insulation	20	2nd Floor Throughout	8,200 SF	Good	63, 63A, 63B	10% Chrysotile	

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180 Mill Street
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Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
M-69	12" x 12" Green Vinyl Floor Tile	26	2nd Floor, Rooms 3, 4, 5, 48, Library	850 SF	Good	47, 47A	4% Chrysotile	
M-70	Black Mastic Associated with 12" x 12" Green Vinyl Floor Tile	26	2nd Floor, Rooms 3, 4, 5, 48, Library	850 SF	Good	48, 48A	3% Chrysotile	
M-71	Red Duct Sealant	20/26	2nd Floor - Throughout the Floor	500 SF	Good	71, 71A, 71B	4% Chrysotile	
M-72	Cementitious Pipe/Breeching Associated with the Laboratory Hoods	26	2nd Floor Unfinished Areas, Lab Areas and Hallways	200 LF	Good	72, 72A	20% Chrysotile 10% Crocidolite	
M-73	Sink Mastic	26	2nd Floor, Labs 36 and 37	2 EA	Good	73, 73A	15% Chrysotile	
T-02	Pipe Elbow Insulation	20	2nd Floor - Throughout the Floor	1,085 EA	Fair	02, 02A, 02B, 02C, 02D	30% Chrysotile	
T-03	White Block Pipe Insulation	20	2nd Floor - Throughout the Floor	735 LF	Fair	03C	25% Chrysotile	
T-02 & T-03	Pipe Elbow Insulation & White Block Pipe Insulation Thermal Debris	20/26	2nd Floor - Throughout the 2nd Floor	20,000 SF	Poor	14, 14A, 14B	15% Chrysotile	Pre-Cleaning of Entire Building to be Performed Prior to the Construction of Any Containments.

Table 1
Asbestos Abatement Table
for Interior Building Materials
180 Mill Street
Cranston, Rhode Island

Homogeneous Application Number	Type of Material	Building #	Material Location	Approximate Quantity	Condition	Sample ID	Analytical Results	Notes
ROOFTOP PENTHOUSE FOR BUILDINGS 20 & 26 - ABATEMENT AREA 4								
M-266	Caulk Associated with Duct Penetrations	20/26	Rooftop Penthouse	180 LF	Good	286D, 286E	2% Chrysotile	
T-10	Duct Insulation	20/26	Rooftop Penthouse	2,500 SF	Good	10, 10A, 10B	40% Chrysotile	
T-02	Pipe Elbow Insulation	20/26	Rooftop Penthouse	175 EA	Poor	02E, 02F, 02G, 02H	15% Chrysotile	
T-02	Pipe Elbow Insulation Thermal Debris	20/26	Rooftop Penthouse	750 SF	Poor	02E, 02F, 02G, 02H	15% Chrysotile	Pre-Cleaning of Entire Penthouse to be Performed Prior to the Construction of Any Containments.
M-41	Stick Pin Mastic Associated with Duct Insulation	20/26	Rooftop Penthouse	2,500 SF	Good	41, 41A	10% Chrysotile	

Table 2
Lights and Ballasts Inventory
BASF Corporation
180 Mill Street
Cranston, RI

Material	Container Type	Container Size	Approximate Quantity	Location
Building 20				
4' Fluorescent Bulbs	Glass	4' bulb	1,300	Throughout the Building
Ballasts for the 4' Fluorescent Bulbs	Metal	--	650	Throughout the Building
8' Fluorescent Bulbs	Glass	8' bulb	14	Throughout the Building
Ballasts for the 8' Fluorescent Bulbs	Metal	--	7	Throughout the Building
Building 26				
4' Fluorescent Bulbs	Glass	4' bulb	800	Throughout (Including Rear Storage Area)
Ballasts for the 4' Fluorescent Bulbs	Metal	--	400	Throughout (Including Rear Storage Area)